INDEX FOR VOLUME 45

AUTHOR AND SUBJECT INDEX. New species and varieties in bold face type. Junior authorship indicated by pages in parentheses. Illustrations are included.

Aabulba, nematode control, 347
Aaventa, nematode control, 347
Aceria spp., see under Insects, mites
Achromycin, peach rosette virus, 348
Acids, organic, effect on TMV multiplication, 291
Acti-dione, see under Fungicides
Actinomycetes, *Pyrenochaeta terrestris*, antagonism, 440; **illuss. 441**
Sclerotium rolfsii, antagonism, 417; **illus. 418**
Actinomycin, soil, production and role, 407
ADAM, ANGELOS V., 285
ADAMS, ROBERT E., 464, 477
Aerobacter spp., *Sclerotium rolfsii* effect, **illus. 418**
Agaricus compestris, see Mushroom
Agathis stigmaterus, 37
Agrimycin, see under Antibiotics
Agrobacterium rubi, blackberry cane gall, 56, **illus. 57**
tumefaciens, antibiotics, inhibition, 618; **illuss. 621, 623**
ALCORN, STANLEY M., 272, 692
Aldrin, see under Insecticides
Alfalfa crown rot, HCN associated with, 667; **illuss. 668, 670, 672**
nematode, stem, control, 348
root-knot, varietal resistance, 70; **illus. 71**
Stemphylium leafspot, 352; **illus. 353**
tobacco anthracnose in, 465
white spot, genetic character, 289
ALLEN, O. N., (618)
ALLEN, PAUL J., 259
ALLINGTON, W. B., 595
ALLMENDINGER, D. F., (110)
Almond bud failure in peach, 323; **illuss. 325, 326**
Alternaria in cotton seedlings, control, 350
fungus culture, 466
solani in tomato fruit tumor, 136
sp. in apple, 392
spp., grape decay, 229
medium for, 461
tomato anthracnose, 340
tomato, temperature effect, 168; **illuss. 169, 171**
ALTMAN, JACK, 183
Amaranthus retroflexus, *Pyrenochaeta terrestris* in, 350
Amberlite 1R-120, antifermentative for culture of *Panagrellus redivivus*, 184
American Phytopathological Society: abstract, Southern Division, 463
Preliminary Symposia, Atlanta, Dec. '55, 442
reports and abstracts; Northeastern Division, 1954-55 winter meeting, 183
Pacific Division, 37th annual meeting, 692
Potomac Division, 1954-55, 464
Southern Division, 52nd annual meeting, 346
Amino acids, *Pseudomonas tabaci* toxin, modes of action, 659; **illuss. 660-663**
AMMANN, ALFRED, 559
Amphorophora rubi, strawberry vein banding virus, 307
ANDERSON, E. J., 238
ANDERSON, H. W., (285)
Antagonism, actinomycetes, *Pyrenochaeta terrestris*, 440; **illuss. 441**
Sclerotium rolfsii, 417; **illus. 418**
Bacillus subtilis, *Rhizoctonia* sp., 252; **illuss. 255, 257**
bacteria, *Sclerotium rolfsii*, 417; **illus. 418**
Bacterium herbicola, *Erwinia* spp. and *Corynebacterium flaccumfaciens*, 466
Xanthomonas and *Pseudomonas* spp., 466
Chaetomium sp., *Verticillium albo-atrum*, 696
fungi, *Sclerotium rolfsii*, 417; **illus. 418**
Antagonism—*continued*
Fusarium roseum, *Verticillium albo-atrum*, 696
Gibberella zeae to *Tilletia* spp., 288
Gliocladium roseum, *Verticillium albo-atrum*, 696
Helminthosporium sativum to *Tilletia* spp., 288
Pyrenochaeta terrestris, actinomycetes, 440; **illuss. 441**
Rhizoctonia sp., *Bacillus subtilis*, 252; **illuss. 255, 257**
Sclerotium rolfsii soil organisms, 417; **illus. 418**
Stysanus sp., *Verticillium albo-atrum*, 696
Tilletia spp., *Gibberella zeae*, 288
Helminthosporium sativum, 288
Verticillium albo-atrum, soil organisms, 696
Anthocyanosis of *Prunus* spp., X-disease infected and carbohydrate content of leaves, 184
Anthracnose, cucumber seed transmission, 348
lettuce, etiology, host range, 375; **illuss. 377, 379**
tobacco, host range, 465
tomato foliage, inoculum source, 338; **illuss. 340, 342-344**
Antibiosis, *Candida intermedia*, *Physalospora tucumanensis*, 37; **illus. 38**
Pyrenochaeta terrestris, actinomycetes, 440; **illuss. 441**
Antibiotics, general, *Agrobacterium tumefaciens* and gall tissue, 618; **illuss. 621, 623, 624**
soil, production and role, 407
Antibiotics, achromycin (tetracycline complex), peach rosette virus, 348
actinomycin, soil, production and role, 407
agrimycin (1 part terramycin to 10 streptomycin), peach rosette virus, 348
pepper bacterial spot, 465
philodendron leaf spot, 694
antimycin A., *Venturia inaequalis* resistance to, 467; **illus. 469**
aureomycin, *Agrobacterium tumefaciens* and gall tissue, 618
hydrochloride (chlortetracycline), peach rosette virus, 348
pear blast, 629
candicidin A, Dutch elm disease, 185
Verticillium sp. in elm, 185
chloramphenicol, *Agrobacterium tumefaciens* and gall tissue, 618; **illuss. 621, 623, 624**
chlorotetracycline and amphomycin, Dutch elm disease, 185
circulin, soil, production and role, 407
clavacin, *Agrobacterium tumefaciens*, and gall tissue, 618; **illus. 623**
cycline compounds, peach rosette virus, 348
cycloheximide, mold control in *Graphium ulmi* isolation, 185
Verticillium sp. in elm, 185
endomycin, turf brown patch, 186
filipin from *Streptomyces* **filipinensis** nov. sp., 559; **illus. 560**
neomycin, soil, production and role, 407
noformicin from *Norcardia formica*, antiviral effect, 281
patulin, Dutch elm disease, 185
Verticillium sp. in elm, 185
penicillin, *Agrobacterium tumefaciens* and gall tissue, 618; **illus. 623**
pleocidin, Dutch elm disease, 185
Verticillium sp. in elm, 185
polymyxin, *Agrobacterium tumefaciens*, and gall tissue, 618; **illuss. 621, 623**
B sulfate, Dutch elm disease, 185
Verticillium sp. in elm, 185
streptomycin, *Agrobacterium tumefaciens* and gall tissue, 618; **illus. 623**
nitrate, pepper bacterial leaf spot, 183
pear blast, 629

Antibiotics, streptomycin—*continued*
Pyracantha, translocation, 692
sulfate, bacterial soft rot, spinach, 88
streptothricin hydrochloride, Dutch elm disease, 185
Verticillium sp. in elm, 185
subtilin, soil, production and role, 407
terramycin, *Agrobacterium tumefaciens* and gall tissue, 618; **illuss. 621, 623, 624**
peach rosette virus, 348
tetracycline, *Pyracantha*, translocation, 692
thiolutin, Dutch elm disease, 185
Verticillium sp. in elm, 185
tyrothricin, *Agrobacterium tumefaciens* and gall tissue, 618
viomycin, soil, production and role, 407
Antimycin A, *Venturia inaequalis*, resistance to, 467; **illus. 469**
Aphis spp., see under Insects, aphid
Apple black rot control, 392; **illuss. 393, 395**
black rot, light effect on pycnidia of pathogen, 22; **illus. 23**
foliage injury, glyodin and arsenic, 185
fruit rot, control, 466
green mottle, 186
leafspot control, 392; **illuss. 393, 395**
light effect on pycnidia of pathogen, 22; **illus. 23**
mosaic virus in peach, 292; **illus. 293**
"pout," *Xiphinema* sp., control, 464, 477
Xiphinema sp. in, control, 464
Apple, J. Lawrence, 346
Arasan, see also Fungicides, thiram, *Rhizoctonia solani*, 466
Aristeo, Acosta C., 503
Ark, Peter A., (692)
Armillaria mellea pathogenicity of isolates, 695
Armstrong, G. M., (346)
Armstrong, J. K., 346
Arny, D. C., 518
Asparagus Penicillium crown rot, symptoms and control, 527; **illus. 528**
Aspergillus, fungus culture, 466
Aster, carnation ringspot virus, 464
celery-yellows virus, leafhopper transmission tests, 185
Fusarium wilt, sumac relationships, 346
Aureomycin, see under Antibiotics
Avocado Verticillium wilt, susceptibility, 635

Bacillus cereus, antibiotics effect, 407
subtilis, antibiotics effect, 407
Rhizoctonia sp., antagonistic, 252; **illuss. 255, 257**
Bacteria, *Sclerotium rolfsii*, antagonism, 417; **illus. 418**
Bacterial blights, bean, resistance testing method, 519; **illus. 520**
canker, tomato, anatomy, 267; **illuss. 268-270**
diseases, soft rot, spinach, control in packaged, 88
leaf spot, pepper, control, 183
spot, pepper, control, 465
Bacteriophage, 196
Xanthomonas malvacearum, attacking, 49, **illus. 50**
pruni, production, 580
spp. strains, specificity, 596; **illus. 597**
Bacterium herbicola, *Corynebacterium flaccumfaciens*, antagonism, 466
herbicola, *Erwinia* spp., antagonism, 466
Pseudomonas spp., antagonism, 466
Xanthomonas spp., antagonism, 466
Bain, Douglas C., 35, 55
Baker, Kenneth F., (509)
Bald, J. G., 156, 693
Barley, calcium sulfamate effect, 503
germination, water-soak seed treatment, effect, 518
loose smut, longevity of pathogen in seed, 637
varietal resistance, 73; **illus. 77**
water-soak seed treatment, control, 518
Barley—*continued*
net blotch, inheritance of resistance, 174
Pythium root rot, adaptation, 97; **illuss. 98, 100**
scald control, 350
stem rust control, 503
wheat streak mosaic virus, mite spread, 116
yellow dwarf virus, Holland, 695
Baxter, Dow V., (694)
Bean bacterial blights resistance, testing method, 519; **illus. 520**
carnation ringspot virus, 464
mosaic virus, a gladiolus—similar to, 696
powdery mildew, chemicals in leaves, 43, **illus. 45**
rust, chemicals in leaves, 43, **illuss. 45, 46**
southern mosaic virus, noformicin effect, 281
seed maturation effect, 17
thiouracil effect, 281
Beet, Fusarium wilt, spinach, relationships, 346
sugar, tobacco anthracnose in, 465
yellow virus, mechanical transmision, 233; **illus. 234**
Begonia, tobacco anthracnose in, 465
Bellis perennis, see English Daisy
Bennett, C. W., (233), 531
Benzene hexachloride, see under Nematocides
Bernstein, L. B., 580, (596)
Bever, Wayne M., (513)
Biographical sketch, Heald, Frederick Deforest, 409, **illus.**
Manns, Thomas Franklin, 241; **illus.**
Miles, Gilbert Frazer, 1, **illus.**
Muncie, Jesse Howard, 523, **illus.**
Tehon, Leo Roy, 115, **illus.**
Tucker, Clarence Mitchell, 351, **illus.**
Biotin, *Sclerotinia trifoliorum*, 39
Bis(dimethylthiocarbamoyl) disulfide, see Fungicides, thiram
Bjornsson, Ida, (465)
Black, L. M., 208
Blackberry cane gall, 56; **illus. 57**
mosaic virus complex, 272; **illus. 273**
Blueberry stunt virus, wild sources, 465
Bluegrass stem rust control, 186
Bloom, J. R., 443
Book listing, 90, 408, 463, 638
Boone, D. M., (467)
Boosalis, Michael G., (293)
Boothroyd, C. W., (186)
Bordeaux, spruce canker, 686
Boron, see also under Nutrition of microorganisms
pear blossom blight, twig dieback, deficiency, control, 110; **illuss. 111, 113**
Borthwick, H. A., (465)
Botryodiplodia phaseoli, potato charcoal rot, India, 91
Botryosphaeria ribis, apple fruit rot phase, control, 466
medium for, 461
Botrytis cinerea, grape decay, 229
cinerea in grapes in storage, control, 137
in tomato fruit tumor, **illus. 133**
gladiolorum nutrition tests, 676; **illus. 677**
Bourne, B. A., 37
Boxwood, *Helicotylenchus*, pathological effect, 464
Brandes, G. A., (350)
Braun, Alvin J., 183
Braun, Armin C., 659
Breece, James R., (696)
Bretz, T. W., 351
Brierley, Philip, 2, 464
Brock, Thomas D., (559)
Browning, J. A., (490)
Bruehl, G. W., 97

Cabbage blackrot, 55
blackrot inheritance of resistance, 35; **illus. 36**
Cactus Helminthosporium stem rot, symptoms and control, 509; **illuss. 510, 511**

Cadmium succinate, snow mold, 59; **illus. 61**
Cairns, Eldon J., 346
Calcium, see also under Nutrition
sulfamate, see under Fungicides
Callistephus chinensis, see China-aster
Calonyction aculeatum for sweet potato internal cork assay, 185
Campbell, Colin E., 644
Campbell, Robert N., 485
Candicidin, see under Antibiotics
Candida, fungus culture, 466
intermedia, *Physalospora tucumanensis*, antibiosis, 37; **illus. 38**
Capitophorus fragaefolii, strawberry vein banding virus, 307
Capsicum frutescens, see Pepper
Captan, see under Fungicides
Carbon dioxide effect on *Rhizoctonia solani* distribution in host, 693
Carnation mosaic virus, 464
ringspot virus, 464
Caroselli, Nestor E., 183, 184
Carpenter, T. R., 520
Carter, Herbert E., (559)
Carter, J. C., 115
Cattleya Fusarium wilt, 599; **illuss. 600, 601**
leaf necrosis, Cymbidium mosaic, 327; **illuss. 328, 329**
Celery, peach yellow leaf roll virus host, 694
Cephalocereus spp., (see also Cactus) top rot, **illus. 510**
Cephalosporium gregatum, asexual reproduction, 293; **illus. 294**
spp., lettuce root rot, associated with, 184
Cercospora capsici, pepper resistance, 347
Ceresan, see under Fungicides
Chaetomium sp., *Verticillium albo-atrum*, antagonistic, 696
Chandler, Philip A., (693)
Chandler, W. A., (185)
Charcoal rot, potato, India, 91
Chard, cucumber mosaic virus, aphid-vector studies, 217
Fusarium wilt, spinach, beet, relationships, 346
Chemical names, fungicides, active ingredients, 295
Chemotherapeutants, 8-hydroxyquinoline benzoate, turf brown patch, 186
8-hydroxyquinoline sulphate, turf brown patch, 186
Chemotherapy, peach rosette virus, antibiotics, 348
Chenopodiaceae, Fusarium wilt, 346
Cheo, Pen Ching, 17, 184, (350)
Cherry buckskin virus, leafhopper vectors, 694
"freckle fruit" virus, 696
necrotic ring spot virus, *Prunus tomentosa* index plant, 320; **illuss. 321-323**
Montmorency, 565
Chessin, M., 288
China-aster, *Stemphylium* **floridanum** in, 11
Chloramphenicol, *Agrobacterium tumefaciens* and gall tissue, 618; **illus. 621, 623, 624**
Chloranil, see under Fungicides
Chlorella vulgaris, *Pseudomonas tabaci* toxin and methionine in, **illus. 660**
Chloride, pineapple injury and control, 590; **illuss. 591, 592**
Chlorogenus callistephi var. *californicus*, leafhopper transmission tests, 185
3-*p*-Chlorophenyl-5-methylrhodanine, see Nematocides, N-244
Chlorophyll role in obligate parasitism, 186
Chlorotetracycline and amphomycin, Dutch elm disease, 185
Chokecherry X-disease, anthocyanosis and carbohydrate content of leaves, 184
Christensen, J. J., (639)
Chrysanthemum aspermy virus, 2; **illus. 5**
flower distortion, 2; **illus. 5**
mosaic virus, 2; **illus. 5**
rust distribution, 644
temperature, 644; **illuss. 645-647**
viruses, 2; **illus. 5**
Citric acid effect on TMV multiplication, 291
Citrus inoculation method, 517, **illuss.**
mulch-sprinkler, nematophagus fungi control, 693
nematophagus fungi, 693
tristeza, yellows and pitting complex, 222
water mold parasites, swarming, 694
Cladosporium cucumerinum, resistant varieties, 451
herbarum, grape decay, 229
Clavacin, *Agrobacterium tumefaciens* and gall tissue, 618; **illus. 623**
Clayton, E. E., (349), (463)
Clitocybe tabescens pathogenicity of isolates, 695
Clover, *Sclerotinia trifoliorum*, toxin, physiological studies, 39
seed, pathogen isolation, method, 94; **illuss. 95, 96**
tobacco anthracnose in, 465
Code, biological taxonomic, 58
Cole, Herbert, Jr., (405)
Coleman, N. T., (348)
Coleus, tobacco anthracnose in, 465
Colletotrichum, fungus culture, 466
lagenarium, cucumber seed transmission, 348
phomoides, *medium* for, 461
tomato foliage, inoculum source, 338; **illuss. 340, 342-344**
sp. host range, 465
Collodonus geminatus, see under Insects, leafhopper
Conifer canker, *Valsa kunzei* relation to, 686; **illus. 688**
Copper, see under Fungicides
Corbett, M. K., 148
Corn, albino chlorophyll relationship in parasitism studies, 186
crown rot, *Helminthosporium turcicum* incitant, 291; **illus. 292**
downy mildew, histology, 350
golden nematode, stimulation of larval emigration, 184
Pyrenochaeta terrestris in, 350
root-knot nematode, **illus. 543**
sugar cane virus, electron microscopy, 694
wheat streak mosaic virus, mite spread, 116
Corynbacterium flaccumfaciens, *Bacterium herbicola*, antagonism, 466
michiganense, medium for, 461
tomato, anatomy of infected plants, 267; **illuss. 268-270**
Costa, A. S., 233
Cotton blight, bacteriophage attacking pathogen, 49, **illus. 50**
Fusarium wilt, nematode studies, 349
Helicotylenchus sp. in, 349
Hoplolaimus coronatus, 349
Meloidogyne sp. in, 349
nematode, Fusarium wilt studies, 349
nub-root, seedling disease expression, 413; **illus. 415**
Pratylenchus sp. in, 349
root-knot nematode, 540
seedling disease control, 350
Couch, Houston B., 63, 375
Coumarin effect on spore germination, *Puccinia graminis*, 259; **illus. 265**
Cowpea, cucumber mosaic virus, resistance, 563
Fusarium wilt, resistance of Brown Sugar Crowder, 347
Cox, R. S., 291
Crag, see under Fungicides
Criconemoides sp., pathogenicity in tobacco and Spanish peanuts, 347
Crittenden, H. W., 347
Crossan, D. F., (465)
Crown gall, tomato, marigold, antibiotics, inhibition, 618; **illuss. 621, 623, 624**
Cucumber anthracnose, seed transmission, 348
carnation ringspot virus, 464
Fusarium wilt, 435; **illuss. 436, 437**
mosaic virus, cowpea resistance, 563

Cucumber mosaic—*continued*
resistant varieties, 451
southern, insect transmision, 217; **illus. 218**
scab resistant varieties, 451
tobacco anthracnose in, 465
ring spot virus, nutrition, 567; **illus. 570**
Curculin, soil, production and role, 407
CURL, E. A., (581)
Curvularia lunata, nutrition tests, 676; **illus. 677**
Cuscuta subinclusa, see Dodder
Cyano (methylmercuri) guanidine, see Fungicides, Panogen
Cycloheximide, see under Antibiotics
and ferrous sulphate, see Fungicides, Acti-dione-Errated
Cymbidium mosaic virus hosts, electron microscopy, 327; **illuss. 328, 329, 331**
Cytospora kunzei var. **kunzei** var. nov., 689
var. **piceae** var. nov., 689

Dahlia spotted wilt, elimination, 224; **illus. 225**
Daisy, English, *Marssonina panattoniana* in, 375
DARROW, GEO. M., 464
Datura stramonium, Cymbidium mosaic virus in, 327; **illus. 331**
stramonium, potato virus X in, 313
yellow-net virus, 479, **illus.**
DAVIS, B. H., (183)
DAVIS, LILY H., (509)
D-D, see under Nematocides
Depolymerase, see under Enzymes
DESJARDINS, PAUL R., (334)
DEWOLFE, T. A., 693, (694)
DEZEEUW, D. J., 523
Dianthus barbatus, aphid transmission of carnation mosaic virus, 464
Diatraea saccharalis, yeast associated with, antibiosis, sugar cane rot, 37
1,2,-Dibromo-3-chloropropane, see under Nematocides
1,2-Dibromoethane, see Nematocides and Soil Fumigants, Dowfume W-85
Phillips hydrocarbon mixture, see Nematocides, PN-20
Dichlone, see under Fungicides
2,4-Dichloro-6 (*o*-chloroanilino)-*syn*-triazine, grape decay in storage, 137
2,3-Dichloro-1, 4-napthoquinone, see Fungicides, dichlone
Dichloropropene-dichloropropane, see Fungicides, DD and Soil Fumigants, DD
DICKSON, J. G., (667)
DIENER, URBAN L., 141, 654
Digitaria sanguinalis, *Pyrenochaeta terrestris*, 350
3-[2-(3,5-Dimethyl-2-oxocyclohexyl)-2-hydroxyethyl] glutarimide, see Fungicides, Acti-dione
DIMOCK, A. W., (644)
DIMOND, A. E., (79)
Dinitrophenol, effect on spore germination, *Puccinia graminis*, 259; **illus. 265**
tomato Fusarium resistance, effect, 303
Diplocarpon rosae control, 465
Disease resistance, see Resistance
Disodium ethylenebis [dithiocarbamate], see Fungicides, nabam
Dithane Z-78, see Fungicides, zineb
Ditylenchus spp., see under Nematodes
Dodder, blueberry stunt virus, 465
curly top virus, water pimpernel, transmission, 531; **illuss. 532, 535**
strawberry vein banding transmission, 307
Dowfume W-85, see under Nematocides
Downy mildew, corn, 350
sorghum, India, 128; **illus. 130**
DROLSOM, P. N., (349)
DROPKIN, V. H., (26)
DUNLEAVY, JOHN, 252
DURBIN, RICHARD D., 509, 693

Echinochloa colona, *Pyrenochaeta terrestris* in, 350
Eggplant, *Pseudomonas solanacearum*, pathogenicity of isolates, 348
EISENSTARK, A., (580), 596
Electron microscopy, apparatus for frozen-dried specimens, **illus. 190**
Cymbidium mosaic identity, 331
methods, 187; **illuss. 189, 190, 192, 194**
sugar cane mosaic virus, 694
TMV, 603; **illuss. 604-606**
tomato ring spot virus, 334; **illus. 336**
wheat mosaic virus, 348
Electrophoresis, squash mosaic virus, 145
tomato ring spot virus, 334; **illus. 335**
virus assay techniques, 211
Eleusine indica, *Pyrenochaeta terrestris* in, 350
ELLIOTT, EDWARD S., (673)
Elm, Dutch elm, disease, antibiotic tests, 185
EMTS, bluegrass stem rust, 186
Endoconidiophora fagacearum longevity under mineral oil, 405
mat formation studies, 485; **illuss. 487, 488**
transmission by squirrels, 581; **illus. 582**
Endomycin, turf brown patch, 186
Endothia parasitica, light, response to, 465
ENGLISH, HARLEY, (239)
Entomosporium macalatum, hawthorn leaf spot, 55; **illus. 55**
Enzymes, depolymerase, *Fusarium oxysporum* f. *lycopersici*, 381, 524; **illus. 525**
methylesterase in *Fusarium oxysporum* f. *lycopersici*, 79; **illus. 82**
pectic, *Fusarium oxysporum* f. *lycopersici*, 381, 524; **illus. 525**
pectin methylesterase, *Fusarium oxysporum* f. *lycopersici*, 381, 524; **illus. 525**
polygalacturonase in *Fusarium oxysporum* f. *lycopersici*, 79; **illus, 82,** 534; **illus. 525**
protopectinase, *Sclerotinia trifoliorum*, 39
Erwinia amylovora, medium for, 461
atroseptica, potato suberin and periderm formation, 649; **illuss. 651-653**
spp., *Bacterium herbicola*, antagonism, 466
Erysiphe polygoni, chemicals in infected leaves, 43; **illuss. 45, 46**
Ethionine, *Pseudomonas tabaci* toxin, modes of action. **illus. 662**
N-(Ethylmercuri-*p*-toluenesulfonanilide), see Fungicides, EMTS
Ethylmercury phosphate, Fungicides, Ceresan, New Improved
EVERETT, H. L., (186)

Fabraea maculata, imperfect stage in India-hawthorn, 55; **illus. 55**
FEDER, WILLIAM A., (347)
FELDMESSER, JULIUS, 347
Ferbam, see under Fungicides
FERGUS, CHARLES L., 405
FERGUSON, JOHN, 693
Fermate, see Fungicides, ferbam
Ferric dimethyldithiocarbamate, see Fungicides, ferbam
FERRIS, J. M., 184
FERRIS, VIRGINIA ROGERS, 546
Fig mosaic virus mite transmission, 52; **illuss. 53, 54**
Filipin from *Streptomyces* **filipinensis** nov. sp., 559; **illus. 560**
FINK, HARRY C., 320
FISCHER, GEORGE W., 409
Flax, nub-root, seedling disease expression, 413; **illus. 415**
rust, host-parasite interaction, genetics, 680
FLOCK, R. A., 52
FLOR, H. H., 680
Formaldehyde, lily bulbs, 693
FOSTER, H. H., 347

Foster, Virginia, 599
Fragaria chiloensis, Verticillium albo-atrum, resistance, 387
spp., variegation, 464
vesca, indexing strawberry virus, 183
virginiana, Verticillium albo-atrum, resistance, 387
Frazier, Norman W., 307
Freeman, T. E., 440
French, David W., (485)
Frey, K. J., 490
Friedman, B. A., 184
Fulkerson, John F., 22
Fungi, filipin from *Streptomyces* **filipinensis**, nov. sp., effective against, 559; **illus. 560**
light, response to, 465
nematophagus, in citrus, 693
Sclerotium rolfsii, antagonism, 417; **illus. 418**
Fungicides, general, asparagus Penicillium crown rot, 529
chemical names, 295
fungi mutants, resistance, *Venturia inaequalis*, 467; **illus. 469**
Rhizoctonia solani soil factors effect, 466
rose blackspot, insecticide and miticide combinations, 465
soil testing, *Phytophthora cinnamomi*, 398; **illus. 401**
Fungicides, Acti-dione (3-[2-(3,5-dimethyl-2-oxocyclohexyl)-2-hydroxyethyl] glutarimide), *Phytophthora cinnamomi*, 398; **illus. 401**
Acti-dione, *Rhizoctonia solani*, 466
Errated (cycloheximide and ferrous sulphate), bluegrass stem rust, 186
Arasan, see also Fungicides, thiram, *Rhizoctonia solani*, 466
B-622 (2,4-dichloro-6-(*o*-chloroanilino)-*syn*-triazine) grape decay in storage, 137
bis(dimethylthiocarbamoyl) disulfide, see Fungicides, thiram
Bordeaux, spruce canker, 686
cadmium succinate, snow mold, 59; **illus. 61**
calcium sulfamate, barley, effect, 503
bluegrass stem rust, 186
oats, effect, 503
stem rust, 503
wheat, effect, 503
fungicides, captan (*N*-(trichloromethylthio)-4-cyclohexene-1,2-dicarboximide) coined name, 100
apple black rot and leaf spot, 392
fruit rot, 466
cactus Helminthosporium stem rot, 509; **illus. 511**
grape decay in storage, 137
peach brown rot, 347
scab, 347
storage rot, 347
rose blackspot, 465
carbamate spray, philodendron leaf spot, 694
ceresan, wheat snow mold control, 696
M, *Septoria avenae* in oats, 182; **illus. 182**
New Improved, (ethylmercury phosphate), *Phytophtora cinnamoni*, 398; **illus. 401**
chloranil (tetrachloro-*p*-benzoquinone) coined name, 100
turf snow mold, 59
Copper Compound A (basic copper chloride), tomato damping-off, 347
oxysulfate, rose blackspot, 465
spray, philodendron leaf spot, 694
Crag 5400 (α,α-trithiobis(*N*-dimethylthioformamide)), grape decay in storage, 137
Potato Fungicide (copper zinc chromate, $2.5CuO \cdot 0.6CdO \cdot ZnO \cdot 10CaO \cdot CrO_3$), tomato damping-off, 347
cycloheximide, grape powdery mildew, 695
peach brown rot, 695
2,3-dichloro-1, 4-naphthoquinone, see Fungicides, dichlone 100

Fungicides—*continued*
dichlone (2,3-dichloro-1,4-naphthoquinone) coined name, bluegrass stem rust, 186
turf brown patch, 186
disodium ethylenebis [dithiocarbamate], see Fungicides, nabam
Dithane Z-78, see also Fungicides, zineb, *Rhizoctonia solani*, 466
EMTS (*N*-(ethylmercuri-*p*-toluenesulfonanilide)), bluegrass stem rust, 186
ferbam (ferric dimethyldithiocarbamate) coined name, 100
cactus Helminthosporium stem rot, 509; **illus. 511**
lily bulbs, 693
Lysol, lily Rhizoctonia rot, 156
Rhizoctonia solani, 466
rose blackspot, 465
tomato damping-off, 347
ferric dimethyldithiocarbamate, see Fungicides, ferbam
sulfate, glyodin and arsenic, apple foliage injury preventative, 185
formaldehyde, lily bulbs, 693
glyodin (2-heptadecyl-2-imidazoline acetate) coined name, 100
and arsenic, apple foliage injury, 185
2-heptadecyl-2-imidazoline acetate, see Fungicides, glyodin arsenate, apple foliage injury, 185
Karathane, rose blackspot, 465
Lysol-ferbam dip, lily Rhizoctonia rot, 156
maleic hydrazide, turf brown patch, 186
30, oats crown rust, 410
maneb (manganous ethylenebis [dithiocarbamate]) coined name, 100
bluegrass stem rust, 186
manganous ethylenebis [dithiocarbamate], see Fungicides, maneb
mercury chloride, snow mold, 59; **illus. 61**
turf brown patch, 186
methyl bromide (bromomethane) gladiolus, *Sclerotium rolfsii*, control and injury, 520
nabam (disodium ethylenebis [dithiocarbamate]) coined name, 100
Panogen (cyano(methylmercuri)guanidine), barley scald, 350
phenyl mercury, snow mold, 59; **illus. 61**
PMAS (phenyl mercury acetate), turf snow mold, 59; **illus. 61**
Puratized Agricultural Spray 6% (tris(2-hydroxyethyl)(phenylmercuri) ammonium lactate), lily bulbs, 693
Rhizoctonia solani, 466
C12-2525 (anilinocadmium lactate; phenylmercury derivatives of 2-mercaptobenzothiazole), tomato damping-off, 347
Semesan (30% 2-chloro-4-(hydroxymercuri) phenol), *Rhizoctonia solani*, 466
sodium sulfanilate, barley, 503
oats, 503
stem rust, 503
wheat, 503
Stauffer N-521 (tetrahydro-3,5-dimethyl-2*H*-1,3,5-thiadiazine-2-thione), *Phytophtora cinnamomi*, 398; **illus. 401**
N-869 (sodium methyldithiocarbamate) pea root rot, *Fusarium solani*, 185
Phytophthora cinnamomi, 398; **illus. 401**
sulfur, rose blackspot, 465
wettable, peach brown rot, scab, storage rot, 347
tetrachloronitrobenzene, grape injury in storage, 137
tetrachloro-*p*-benzoquinone, see Fungicides, chloranil
tetramethylthiuram disulfide, see Fungicides, thiram
thiram (bis(dimethylthiocarbamoyl) disulfide) coined name, 100
snow mold, 59; **illus. 61**

Fungicides, thiram—*continued*
tetramethylthiuram disulfide, alternate name, 100
turf brown patch, 186
N-(trichloromethylthio)-4-cyclohexene-1, 2-dicarboximide, see Fungicides, captan
Vancide 51, *Rhizoctonia solani*, 466
ZW (zinc dimethyldithiocarbamate; zinc 2-mercaptobenzothiazole), tomato damping-off, 347
zinc dimethyldithiocarbamate, see Fungicides, ziram
ethylenebis[dithiocarbamate], see Fungicides, zineb
zineb (zinc ethylenebis[dithiocarbamate]) coined name, 100
apple fruit rot, 466
bluegrass stem rust, 186
cotton seedling diseases, 350
rose blackspot, 465
tomato damping-off, 347
ziram (zinc dimethyldithiocarbamate) coined name, 100
Rhizoctonia solani, 466
tomato damping-off, 347
Fungus culture conservation, method comparison, 466
Fusarium in cotton seedlings, control, 350
fungus culture, 466
lini, cultural characteristics, variation, 240
moniliforme, sugar cane red rot, 37
nivale in turf, control, 59; **illus. 61**
oxysporum f. *gladioli*, control, 693
nutrition tests, 676; **illus. 677**
f. *lycopersici*, enzyme role, 381
nutrient sprays effect on host response, 443
pectic enzymes, 79; **illus. 82**; 524; **illus. 525**
tomato resistance, 303
var. *nicotianae*, composition of leaves, 506
nutrition and metabolism, 350
rubrofusarin production, 350
tobacco resistance, 348
xanthone production, 350
f. *vasinfectum*, nematodes related to, in cotton, 349
roseum, *Verticillium albo-atrum* antagonistic, 696
solani, pea root rot control, 185
sp. in lily, 693
spp., cucumber, 435; **illuss. 436, 437**
lettuce root rot, associated with, 184
muskmelon, 435; **illus. 436**
nub-root, cotton and flax, 413
watermelon, 435; **illus. 436**
wilt, aster and sumac relationships, 346
beet and spinach, host relationships, 346
Cattleya, 599; **illuss. 600, 601**
cowpea, resistance of Brown Sugar Crowder, 347
spinach and beet, host relationships, 346
sumac and aster relationships, 346

Galacturonic acid, polygalacturonase produced, tomato Fusarium wilt, 79
Gallegly, M. E., 103, 464, (473)
Gammon, Earle T., (520)
Garlic, *Pyrenochaeta terrestris* in, 350
Genetics, alfalfa white spot, 289
barley resistance to net blotch, 174
cabbage blackrot resistance, 35; **illus. 36**
cowpea, cucumber mosaic virus, resistance, 563
flax rust, host-parasite interaction, 680
tomato resistance to *Phytophthora infestans* races, 103
Ustilago kolleri, haplo-lethal deficiency, 521, **illus.**
Geranium maculatum variegated, chlorophyll role, studies with *Puccinia polygoni-amphibii*, 186
spp. bacterial stem and leaf disease, 613; **illus. 616.**
tobacco antharcnose ni, 465
Gibberella zeae, *Tilletia* spp., antagonism, 288
Gilmer, R. M., 184
Gilpatrick, J. D., (576)
Gladiolus, fungal pathogens, nutrients effect on growth and pathogenicity, 676; **illus. 677**

Gladiolus—*continued*
Fusarium disease, control, 693
hot-water treatment, 693
Sclerotium rolfsii, methyl bromide, control and injury, 520
soil treatment, 693
Stemphylium **floridanum** in, 15
a virus similar to bean mosaic, 696
Gliocladium roseum, *Verticillium albo-atrum*, antagonism, 696
Glomerella cingulata, marker strain, tomato anthracnose studies, 338
spp., medium for, 461
Glyodin, see under Fungicides
Goheen, A. C., (465)
Gold, A. H., (327), 693, 694
Golden, A. Morgan, 464
Gomphrena, carnation ringspot virus, 464
globosa, lettuce mosaic, 63
potato virus X in, 313
Gothoskar, S. S., 303, 381, (524)
Gottlieb, David, (407), (559)
Graham, J. H., 227, 633
Graham, T. W., 347
Grape decay in storage, control, 137
powdery mildew control, 695
storage, decay forecasting, 229; **illuss. 230, 231**
Grapefruit, tristeza, yellows and pitting complex, 222
Graphium ulmi, antibiotic tests, 185
Grass, bent, nematode control, 350
brown patch control, 186
orchard, *Pleospora phaeocomes*, 633, **illus.**
tobacco anthracnose in, 465
wheat streak mosaic virus, mite spread, 116
Grasso, Vincenzo, 521
Gray, Reed A., 281
Green mottle of apple, 186
Griffith, R. B., 428
Grogan, R. G., (267), (375)

Hagedorn, D. J., (603), (665)
Halma, F. F., (635)
Hamilton, Richard I., 293
Hannon, Chancellor, I., 11, 184
Hansen, H. N., (55)
Hansing, E. D., (8)
Hare, W. W., 347
Harrison, A. L., 347
Harvey, John M., 137, 229
Hashimoto, S., (693)
Hawthorn, Entomosporium leaf spot, 55; **illus. 55**
Heald, Frederick Deforest, biographical sketch, 409, **illus.**
Herbert, T. T., 348
Heggestad, H. E., 348, 463
Heidrick, L. E., 250
Held, Victor M., 39
Helicotylenchus sp., see under Nematodes
Helminthosporium cactivorum, symptoms and control, 509; **illuss. 510, 511**
dictyoides var. **phlei,** var. nov., 227; **illus. 227**
fungus culture, 466
sativum, oats resistance to, 219; **illus. 220**
Tilletia spp., antagonism, 288
turcicum, corn crown rot incitant, 291; **illus. 292**
medium for, 461
victoriae toxin production, 453; **illuss. 456, 457**
Helms, Katie, (493), 567
Henderson, R. G., 348
Hendersonula toruloidea in walnut, sunburn effect, control, 607; **illuss. 608, 609, 611**
Heptachlor, see under Nematocides
1,4,5,6,7,8,8,Heptachloro-3a, 4,7,7a-tetrahydro-4, 7-methanoindene, see Nematocides, Heptachlor
2-Heptadecyl-2-imidazoline acetate, see Fungicides, glyodin

Heterocaryosis, *Puccinia graminis* var. *tritici*, basis for variation, 639; **illuss. 641, 643**
Heterodera spp., see under Nematode
Heuberger, J. W., 241, (466)
Hewitt, Wm. B., (267)
Heyne, E. G., 8
Himelick, E. B., 581
Hogsett, J. N., (185)
Holmes, Francis O., 185, 224
Holmes, F. W., 185
Hooker, W. J., (313), (445), (523)
Hoplolaimus coronatus in cotton, 349
Horn, N. L., 348
Huffman, M. D., 278
Hutchinson, M. T., 465
Hwang, Shuh-Wei, (466)
Hydrogen-ion concentration, *Helminthosporium victoriae* toxin production, effect, 453; **illus. 457**
effect on *Phytophthora parasitica* var. *nicotianae* isolates, 346
poinsettia root rot, 552; **illus. 553**
soil, *Rhizoctonia solani*, effect, 466
8-Hydroxyquinoline benzoate, see under Chemotherapeutants
sulphate, see under Fungicides

Ichikawa, S. T., 576
Indole acetic acid, potato virus Y effect, 148
Inheritance of resistance, barley to net blotch, 174
cabbage, to blackrot, 35; **illus. 36**
cowpea to cucumber mosaic virus, 563
cucumber to mosaic, varieties, 451
to scab, varieties, 451
oats to crown rust, 219; **illus. 220**
Helminthosporium blight, 219; **illus. 220**
potato varieties to late blight in South America, 247
Solanum spp. to *Phytophthora infestans* races, breeding, 464
strawberry to Verticillium wilt, 387; **illus. 388**
tobacco to black shank, varieties, 463
to Fusarium wilt, varieties, 463
to mosaic virus, varieties, 463
to wildfire, varieties, 463
tomato to late blight, 103, 186
Phytophthora infestans races, breeding, 464
Venturia inaequalis to fungicides, tests, 467; **illus. 469**
Insecticides, general, rose blackspot, fungicide, miticide combinations, 465
Insecticides, aldrin, stem nematode, alfalfa, 348
malathion, rose blackspot, fungicide combination, 465
parathion, stem nematode, alfalfa, 348
Insects, general, larvae, sweet potato internal cork phellem diagnostic symptom, 290
virus assay techniques, review, 196, 208
Insects, *Agathis stigmaterus*, 37
aphid, *Amphorophora rubi*, strawberry vein banding virus, 307
Aphis gossypii, cucumber southern mosaic virus, 217
rumicis, cucumber southern mosaic virus, 217
bean, cucumber southern mosaic virus, 217
black peach, crown gall, 349
Capitophorus fragaefolii, strawberry vein banding virus, 307
cotton, cucumber southern mosaic virus, 217
green peach, cucumber southern mosaic virus, 217
Macrosiphum granarium, barley and oats yellow dwarf virus, 695
pelargonii, strawberry vein banding virus, 307
pisi, pea streak virus, 665, **illus.**
Myzus ornatus, strawberry vein banding virus, 307
persicae, carnation mosaic virus, 464
cucumber southern mosaic virus, 217
lettuce mosaic transmission, 357; **illus. 368**
tomato virus Y transmission, 148
yellow-net virus, 579, **illus.**
Rhopalosiphum prunifoliae, barley and oats yellow dwarf virus, 695
Diatraea saccharalis, yeast associated with, antibiosis, sugar cane rot, 37
flea beetle, tomato anthracnose, 340, **illus.**
leafhopper, *Collodonus geminatus*, cherry buckskin virus, 694
Collodonus geminatus, peach yellow leaf roll virus, celery, 694
Macrosteles fascifrons, celery-yellows virus transmission tests, 185
mites, *Aceria ficus*, fig mosaic transmission, 52, **illus. 54**
Aceria tulipae, wheat streak mosaic virus, spread, control, 116, **illuss. 117-120**
Iodoacetic acid, antifermentative for cultures of *Panagrellus redivivus*, 184
Ipomoea tricolor for sweet potato internal cork assay, 185

Jacobson, Louis, (43)
Jeffers, W. F., (466)
Jensen, D. D., 327, 694
Jimson weed, tobacco anthracnose in, 465
John, C. A., 636
Johnson, Folke, 110
Johnson, Gestur, (626)
Jones, Fred Reuel, 289
Jones, Jack E., (349)
Jones, Julian, (349)
Judy, T. M., (466)

Kaesberg, Paul, (145), (187)
Kahn, Robert P., 334, 500
Karathane, rose black spot, 465
Keitt, G. W., (467)
Keller, John R., 552
Kelman, Arthur, 348, (537)
Kenknight, Glenn, 348, 349
α-Ketoglutaric acid effect on TMV multiplication, 291
Kingsland, G. C., 185
Kirkpatrick, Hugh C., 292, (574)
Klemmer, H. W., 618
Klotz, L. J., (517), (693), 694
Kofranek, A. M., (156)
Krupka, L. R., 465
Krusberg, Lorin R., 349

Lactuca sativa, see lettuce
spp., *Marssonina panattoniana* in, 375; **illuss. 377, 379**
Laird, Edward F., Jr., (595)
Lane, Susan A., 185
Latterell, Frances M., (500)
Leach, Charles M., 94, 405
Lebeau, J. B., 667
Leben, Curt, 467, (518)
Legume seed, pathogen isolation from, method, 94; **illuss. 95, 96**
Lemon inoculation method, 517, **illuss.**
tristeza, yellows and pitting complex, 222
Leptosphaeria avenaria pycnidial stage in oats, 278; **illuss. 279, 280**
Lethum australiense elimination in dahlias, 224; **illus. 225**
Lettuce anthracnose, etiology, host range, 375; **illus. 377, 379**
mosaic virus, aphid transmission, 357; **illus. 368**
seed transmission, 63; **illuss. 65, 67**
root rot, organisms and conditions associated with, 184
tobacco anthracnose in, 465
Light effect on aphid transmission of lettuce mosaic virus, 357
fungi, response to, 465
Physalospora obtusa effect on pycnidia production, 22; **illus. 23**
Sclerotinia trifoliorum apothecial production, 185
sugar beet yellows transmission, 233
wheat bunt resistance, 428

Lily, Croft, propagation, pathogen-free stocks, 693
leaf scorch and root rot, nutrition, control, 156; **illus. 159**
LINDBERG, GEORGE D., (145)
LINDNER, R. C., 574
LIVINGSTON, J. E., (503)
LORDELLO, LUIZ GONZAGA E., 465
LOWNSBERY, B. F., 163
LUCAS, G. B., (459), 537
LUKE, H. H., 453
LUND, STEVE, 181
LUNT, O. R., (156)
Lycopersicon esculentum, see Tomato
Lycopersicum esculentum var. *cerasifolium* resistance to tomato late blight, 186
Lycopodium sp., quantitative cyclone spore collector method, 240

Macrosiphum spp., see under Insects, aphid
Macrosteles fascifrons, celery yellows transmission tests, 185
Magnesium, see under Nutrition of microorganisms
MAGILL, MARY A., (295)
MAI, W. F., (184)
Maize, *Sclerospora sorghi* in, India, 128; **illus. 130**
Maleic hydrazide, see under Fungicides
Maneb, see under Fungicides
Manganous ethylenebis [dithiocarbamate], see Fungicides, maneb
Mangel Fusarium wilt, beet, relationships, 346
Manns, Thomas Franklin, biographical sketch, 241; **illus.**
Maple wilt, soil and sapwood water content, relation, 184
toxins produced by fungus, 183
MARAMOROSCH, KARL, 185
Marigold crown gall, antibiotics, inhibition, 618; **illuss. 621, 623, 624**
MARKLEY, BRIAN B., (693)
Marmor tritici, electron microscopy, 348
tritici, a winter rye for identifying, 637
upsilon, potato varieties reaction to, 148
virgatum, mite spread in wheat, 116; **illuss. 117-120**
MARSHALL, BARTON H., JR., 465, (465), 676
Marssonina panattoniana, lettuce, etiology, host range, 375; **illuss. 377, 379**
MARTIN, G. C., (26)
MARTIN, J. P., (694)
MARTIN, MARY, 407
MARTIN, W. J., 349
MARVEL, M. E., (103)
MCBETH, C. W., (576)
MCCALLAN, S. E. A., 295
MCCLEAN, A. P. D., 222
MCCLELLAN, W. D., 465
MCKEEN, W. E., 629
MEINERS, JACK P., 59
Melampsora lini, host-parasite interaction, 680
Meloidogyne spp., see under Nematodes
MENZIES, J. D., 527
Mercury chlorides, see under Fungicides
Methionine and tobacco wildfire toxin, 659; **illuss. 660-663**
Methyl bromide (bromomethane), see under Fungicides and under Soil fumigants
Methyl naphthoquinone, effect on spore germination, *Puccinia graminis*, 259; **illus. 265**
MIDDLETON, JOHN T., 694
MILBRATH, J. A., (696)
Miles, Gilbert Frazer, biographical sketch, 1, **illus.**
MILLER, LAWRENCE P., (295)
MILLER, PATRICK M., 461
MILLER, V. L., (110)
Millet, wheat streak mosaic virus, mite spread, 116
MILLIKAN, D. F., 565
MITCHELL, A. E., 185
Miticides, general, rose blackspot, fungicide, insecticide combinations, 465
Miticides, aramite, rose blackspot, fungicide combination, 465
ovotran, rose blackspot, fungicide combination, 465
Monilinia fructicola, light, response to, 465
MOORE, E. L., 349
MORGAN, O. D., 465
MORTON, D. J., 417
Moth borer, see Insects, *Diatraea saccharalis*
Muncie, Jesse Howard, biographical sketch, 523, **illus.**
MUNNECKE, DONALD E., (613), 694
Mushroom, *Ditylenchus* sp. in, 346
nematode injury, 346
Muskmelon Fusarium wilt, 435; **illus. 436**
Myzus spp., see under Insects, aphids

N-244, see under Nematocides
NATTI, JOHN J., 185
NELSON, R. R., 352, 639
Nemagon, see Nematocides, 1,2-dibromo-3-chloropropane, 576; **illus. 577**
Nematocides, Aabulba, 347
Aaventa, 347
benzene hexachloride, apple "pout", 477; **illuss. 477, 478**
Xiphinema sp. peach and apple, 464, 477; **illuss. 477, 478**
D-D (1,3-dichloropropene; 1,2-dichloropropane), tobacco, 349
tobacco root-knot, 349
1,2-dibromo-3-chloropropane (nemagon), soil diffusion, 576; **illus. 577**
Dowfume W-85 (1,2-dibromomethane), tobacco, 349
tobacco root-knot, 349
Heptachlor (1,4,5,6,7,8,8, heptachloro-3a, 4,7,7a-tetrahydro-4, 7-methanoindene) turf, nematode, 350
N-244 (3-*p*-chlorophenyl-5-methylrhodanine) turf, nematode, injury and control, 350
PN-20 (20% 1,2-dibromomethane in Phillips hydrocarbon mixture), tobacco, 349
R-I-26 (an unsaturated aliphatic compound), turf, nematode, 350
V-C 1-13 (a neutral ester of phosphorothioic acid), turf, nematode, 350
Nematodes, general, citrus, control, 693
control, organic mercury dips, 347
cotton Fusarium wilt studies, 349
estimating population method, 238; **illus. 238**
injury to mushroom in absence of microorganisms, 346
nemagon soil diffusion, 576; **illus. 577**
turf, control, 350
Nematodes, *Criconemoides* sp. pathogenicity in tobacco and Spanish peanuts, 347
Ditylenchus dipsaci in alfalfa, control, 348
sp. in mushroom, 346
ectoparasitic, strawberry root rot and decline, control, 183
Helicotylenchus, boxwood, 464
sp. in cotton, 349
spp., tobacco, control, 349
Heterodera rostochiensis control, 347
rostochiensis, host and non-host stimulation of larval emigration, 184
tabacum effect on growth of tobacco, control, 163
Hoplolaimus coronatus in cotton, 349
Meloidogyne arenaria perineal patterns, **illus. 29**; 34
arenaria, tobacco rotation, 540; **illuss. 543, 544**
thamesi perineal patterns, **illus. 30**; 34
brevicauda perineal patterns, **illus. 33**; 34
exigua perineal patterns, **illus. 33**; 34
hapla perineal patterns, **illus. 28**; 34
soybean resistance, 347
incognita perineal patterns, **illus. 31**; 34
acrita, alfalfa, 70; **illus. 71**
cotton, 540; **illuss. 543, 544**
cotton Fusarium wilt, 349
perineal patterns, **illus. 32**; 34
soybean resistance, 347

Nematodes, *Meloidogyne incognita acrita—continued*
tobacco Granville wilt, 537; **illuss. 538, 539**
rotation, 540; **illuss. 543, 544**
javanica, alfalfa, 70; **illus. 71**
perineal patterns, 26; **illuss. 26, 27**
sp. in cotton, 349
tobacco, control, 349
resistance, 349
spp. control, 347
nemagon, soil diffusion, 576; **illus. 577**
perineal patterns, 26, **illuss. 27-33**
soybean, Brazil, 465
tobacco black shank relationship, 459; **illus. 460**
Panagrellus redivivus, antifermentative chemicals for culture of, 184
Paratylenchus minutus, estimating populations, 238; **illus. 238**
Pratylenchus sp. in cotton, 349
sp., tobacco resistance, 349
spp. control, 347
tobacco, control, 349
root-knot, see also Nematodes, *Meloidogyne*
alfalfa, 70; **illus. 71**
seasonal fluctuations, tobacco, **illus. 543**
soybean resistance, 347
structure, function and host, 466
sweet potato internal cork, phellem, diagnostic symptom, 290
Rotylenchus brachyurus pathogenicity in tobacco, 347
Trichodorus sp. in cotton, 349
Tylenchorhynchus claytoni, tobacco, control, 349
claytoni, tobacco resistance, 349
sp. in cotton, 349
Xiphinema americanum, tobacco, control, 349
sp., apple and peach, control, 464, 477; **illuss. 477, 478**
Neomycin, soil production and role, 407
NEWSOM, L. D., (349)
Nicotiana glutinosa, mosaic virus, chemicals in leaves, 43; **illus. 45**
glutinosa, potato virus X, nutrition, 567; **illus. 570**
potato virus X in, temperature effect, 493; **illuss. 494-496**
TMV, calcium deficiency effect, 288
on lesions, 695
temperature of infection effect, 595
time course studies, 695
tabacum, see Tobacco
NIELSEN, L. W., (290)
Nitrogen, see under Nutrition and Nutrition of microorganisms
Nocardia formica, antibiotic from, antiviral effect, 281
Noformicin, see also under Antibiotics
bean southern mosaic virus, 281
tobacco mosaic virus, 281
Nomenclature, fungicides, 295
NOUR-ELDIN, FARID, 291
Nub-root, cotton, 413; **illus. 415**
flax, 413; **illus. 415**
NUSBAUM, C. J., 349, (540)
Nutrient sprays, tomato Fusarium wilt, 443
Nutrition, calcium, TMV, deficiency effect on *Nicotiana glutinosa*, 288
calcium chloride, tomato Fusarium wilt, spray, 443
lilies Rhizoctonia rot and injury, 156; **illus. 159**
nitrogen, lily Rhizoctonia rot and injury, 156; **illus. 159**
potato X, *Nicotiana* spp., 567; **illus. 570**
tobacco ring spot, cucumber, 567; **illus. 570**
tomato Fusarium wilt, sprays, 443
phosphorus, potato X, *Nicotiana* spp., 567
tobacco ring spot virus, cucumber, 567
potassium chloride, tomato Fusarium wilt, spray, 443
potato X, *Nicotiana* spp., 567; **illus. 570**
sodium chloride, tomato Fusarium wilt, spray, 443
Nutrition—*continued*
tobacco ring spot virus, cucumber, 567; **illus. 570**
tomato Fusarium wilt, sprays effect, 443
Nutrition of microorganisms, biotin, *Sclerotinia trifoliorum*, 39
boron, *Stromatinia gladioli*, 465
Botrytis gladiolorum, 676; **illus. 677**
carbon sources, basidiomycete, low temperature, **illus. 668**
Fusarium oxysporum var. *nicotianae*, 350
Curvularia lunata, 676; **illus. 677**
Fusarium oxysporum f. *gladioli*, 676; **illus. 677**
magnesium, *Stromatinia gladioli*, 465
nitrogen sources, basidiomycete, low temperature, **illus. 668**
Fusarium oxysporum var. *nicotianae*, 350
Sclerotinia trifoliorum, 39
Stromatinia gladioli, 465
phosphorus, *Stomatinia gladioli*, 465
potassium, *Stromatinia gladioli*, 465
Sclerotinia trifoliorum, 39
Stemphylium sp., 676; **illus. 677**
Stromatinia gladioli, 676; **illus. 677**
sclerotia production, 465
vitamin Bs, *Sclerotinia trifoliorum*, 39
NYLAND, GEORGE, 694

Oak stump solution intake, 466
trunk canker, *Polyporus hispidus*, 177; **illuss. 179, 180**
wilt fungus longevity under mineral oil, 405
mat formation studies, 485; **illuss. 487, 488**
transmission by squirrels, 581; **illus. 582**
Oats, black stem phase of Septoria disease, 278
calcium sulfamate effect, 503
crown rust control, 410
reaction, 462; **illus.**
resistance to, 275
germ plasm, 219; **illus. 220**
sources of, method, 410
Helminthosporium blight, resistance, germ plasm, 219; **illus. 220**
victoriae toxin production, 453; **illuss. 456, 457**
root-knot nematode, **illus. 543**
Septoria avenae in, moisture and temperature effect, control, 181; **illus. 182**
disease, 278; **illuss. 279, 280**
stem rust control, 503
resistance, X-ray, mutation, 490
yellow dwarf virus, Holland, 695
OCHOA, C., 247
OGAWA, JOSEPH M., 239, 695
OHMS, R. E., 513
Onion pink root hosts, 350
Orange inoculation method, 517, **illuss.**
tristeza, yellows and pitting complex, 222
Orchid Fusarium wilt, 599; **illuss. 600, 601**
Oryzopsis hymenoides, wheat streak mosaic mite spread, 116
OSWALD, J. W., (428), (693), 695
OWEN, JOHN H., 435
Oxyquinoline benzoate, antifermentative for cultures of *Panagrellus redivivus*, 184

PALMITER, D. H., 186
Panagrellus redivivus, antifermentative chemicals for culture of, 184
Panogen, barley scald, 350
PANTIDOU, MARIA E., 338
Paratylenchus minutus, estimating populations, 238; **illuss. 238**
Parathion, see under Insecticides
PARKER, K. G., (186)
PARRACK, A. L., (49)
Patulin, see under Antibiotics
PAULUS, ALBERT OTTO, 168

Pea, *Macrosiphum pisi*, streak virus, 665, **illus.**
root rot, *Fusarium solani*, control, 185
streak virus, electron microscopy, **illus. 189**
tobacco anthracnose in, 465
Peach, apple mosaic virus, 292; **illus. 293**
blackberry mosaic virus, transmission to, 272
brown rot control, 347, 695
crown gall, black peach aphid, 349
"mule ear" virus disorder, 323; **illuss. 325, 326**
Rhizopus control, 347
rosette virus, antibiotics, chemotherapy, 348
Prunus tomentosa index plant, 320; **illuss. 321-323**
scab control, 347
spring canker, time of infection related to, 285
storage rot control, 347
western X disease, yellow leaf roll, interference, 694
Xiphinema sp. in, control, 464, 477; **illuss. 477, 478**
yellow bud mosaic virus, soil, retention by, 696
yellow leaf roll virus, celery host, 694
leafhopper transmission, celery, 694
western X, interference, 694
Peanut, *Pseudomonas solanacearum*, pathogenicity of isolates, 348
root-knot nematode, **illuss. 543, 544**
Spanish, *Criconemoides* sp. pathogenicity on, 347
Pear blast, *Pseudomonas syringae*, control, 629; **illus. 630**
blossom blast, boron deficiency, control, 110; **illuss. 111, 113**
twig dieback, boron deficiency, control, 110; **illuss. 111, 113**
Pectic enzyme, see under Enzymes
Pectin methylesterase, see under Enzymes
Pelargonium spp. bacterial stem and leaf disease, 613; **illus. 616**
Penicillin, *Agrobacterium tumefaciens* and gall tissue, 618; **illus. 623**
Penicillium in cotton seedlings, control, 350
fungus culture, 466
martensii in asparagus, symptoms and control, 527; **illus. 528**
oxalicum, filipin, assay, 559
spp., citrus inoculation method, 517, **illuss.**
Peperomia, nematode control, 347
Pepper bacterial leaf spot, control, 183, 465
Cercospora sapsici, resistance, 347
cucumber mosaic virus, aphid-vector studies, 217
Stemphylium **floridanum** in, 11
tobacco anthracnose in, 465
Peronospora effusa, spinach resistance, screening plants for, 635
Person, L. H., (348)
Peru, potato wild species and breeding, 247
Pestalotia sp., light, response to, 465
Peters, B. G., (163)
Peterson, C. E., (313), (445)
Petunia hybrida, see Petunia
Stemphylium **floridanum** in, 11
Phaseolus vulgaris, see Bean
Phellem, sweet potato internal cork, diagnostic symptom, 290
Phenolic compounds, *Streptomyces scabies*, 626; **illus. 627**
Phenyl mercury acetate, see Fungicides, PMAS
Philodendron hastatum, physiologic leaf spot, control, 694
nematode control, 347
Phleum pratense, see Timothy
Phosphorus, see under Nutrition of Microorganisms
Photoperiod, barley Pythium root rot, 97; **illus. 100**
Physalis spp. yellow-net virus, 579, **illus.**
Physalospora obtusa in apple and control, 392; **illus. 393, 395**
obtusa, light effect on pycnidia production, 22; **illus. 23**
medium for, 461
tucumanensis, *Candida intermedia*, antibiosis, 37
Phytophthora aphanidermatum, swarming, 694
capsici mating with tobacco isolates, *P. parasitica*, 346
Phytophthora—*continued*
cinnamomi, fungicides, tests, 398; **illus. 401**
citrophthora, swarming, 694
infestans, medium for, 461
physiologic races, use in breeding, 464
potato breeding for resistance, review, 250
races, potato to tomato, 473
Solanum demissum, histology, 546; **illuss. 549, 551**
spp., breeding for resistance, South America, 247
temperature effect on germination, 673; **illuss. 674, 675**
tomato inheritance of resistance, 103, 186
parasitica, swarming, 694
var. *nicotianae* isolate comparisons, 346
nematode relationship to tobacco resistance, 459; **illus. 460**
pathogenicity, 346
resistant varieties, 463
tobacco resistance, 348
spp. on wild plants, 694
Pierson, C. F., (451), 524
Pine, T. S., 267
Pineapple, chloride injury and control, 590; **illuss. 591, 592**
sea water injury and control, 590; **illus. 591, 592**
Pleocidin, see under Antibiotics
Pleospora herbarum, medium for, 461
lycopersici in tomato fruit tumor, 136
phaeocomes in orchard grass, 633, **illus.**
PN-20, see under Nematocides
Poa compressa, wheat streak mosaic, mite spread, 116
Poinsettia root rot, 552; **illuss. 553, 555, 557**
Polley, Dorothy, (110)
Polygalacturonase, see under Enzymes
Polymyxin, see under Antibiotics
Polyporus hispidus, oak trunk canker, 177; **illuss. 179, 180**
Popp, W., 585
Porter, R. H., 637
Potassium, see under Nutrition and Nutrition of Microorganisms
Potato, breeding for yield, South America, 248
charcoal rot, India, 91
frost injury, breeding for resistance, South America, 247
golden nematode, stimulation of larval emigration, 184
internal brown spot associated with hot dry weather, 184
late blight, breeding for resistance, review, 250
breeding for resistance, South America, 247
leafroll virus, reaction of starch from cells, 185
Phytophthora infestans, histology, 546; **illuss. 549, 551**
races, tomato, relationship, 473
Pseudomonas solanacearum, pathogenicity of isolates, 348
scab, phenolic compounds, inhibition, 626; **illus. 627**
soft rot, suberin and periderm formation, 649; **illuss. 651-653**
Stemphylium **floridanum** in, 11
virus S, latent virus related to, 693
virus X immunity, 445; **illuss. 447-449**
immunity, clonal lines, 313; **illuss. 316, 318**
latent virus related to S, 693
nutrition, *Nicotiana* spp., 567; **illus. 570**
temperature effect in *Nicotiana* spp., 493; **illuss. 494-496**
virus Y, varieties reaction to, 148
yellow-dwarf virus, techniques, review, 208; **illus. 214**
Pothos, nematode control, 347
Pound, Glenn S., (168), 493, (567)
Powdery mildew, beans, chemicals in leaves, 43, **illus. 45**
Powell, Dwight, (285)
Powers, H. R., Jr., (459)
Pratylenchus spp., see under Nematodes
Protopectinase, see under Enzymes
Prune dwarf virus, *Prunus tomentosa* index plant, 320; **illuss. 321-323**

Prunus americana, X-disease, anthocyanosis and carbohydrate content of leaves, 184
domestica, X-disease, anthocyanosis and carbohydrate content of leaves, 184
mahaleb, *P. tomentosa*, virus index plant, 320; **illus. 323**
ring spot virus, 565
sieboldi, X-disease, anthocyanosis and carbohydrate content of leaves, 184
spp. X-disease, anthocyanosis and carbohydrate content of leaves, 184
tomentosa, cherry viruses index plant, 320; **illuss. 321-323**
virginiana, see Chokecherry
Pseudomonas phaseolicola, resistance to, testing method, 519; **illus. 520**
solanacearum, pathogenicity of isolates, different hosts, 348
root-knot nematode in tobacco, 537; **illuss. 538, 539**
tobacco, composition of leaves, 506
spp., *Bacterium herbicola*, antagonsims, 466
Sclerotium rolfsii effect, **illus. 418**
syringae, pear blast, 629; **illus. 630**
tabaci, resistant varieties, 463
toxin, mode of action, 659; **illuss. 660-663**
Pseudoplea briosiana, *Stemphylium botryosum*, relationship, 352
chrysanthemi distribution, 644
temperature, 644; **illuss. 645-647**
Puccinia coronata control, 410
coronata, oats, resistance, sources of, method, 410
var. *avena*, oats reaction, 462, **illus.**
oats resistance, 275
glumarum, races in South America, 245
graminis avenae, oats resistance, X-ray mutation, 490
control in bluegrass, 186
f. *tritici* control, 503
heterocaryosis basis for variation, 639; **illus. 641, 643**
races in South America, 242; **illus. 243**
self-inhibition, role in germination, 259; **illuss. 260, 261, 263, 265**
polygoni-amphibii, chlorophyll relationship in parasitism, 186
sorghi, chlorophyll relationship in parasitism, 186
spp. races in South America, 242
triticina, races in South America, 242; **illus. 244**
Puratized Agricultural spray, see under Fungicides
PURDY, LAURENCE H., 421
Pycnidial production, light effect, *Physalospora obtusa*, 22; **illus. 23**
Pyracantha, streptomycin translocation, 692
tetracycline translocation, 692
Pyrenochaeta terrestris, actinomycetes antagonism, 440; **illuss. 441**
Pythium arrhenomanes, barley adaptation, 97; **illuss. 98, 100**
cotton seedlings, control, 350
sp., tomato damping-off control, 347
spp., lettuce root rot, associated with, 184
nub-root, cotton and flax, 413
poinsettia root rot, 552; **illus. 555**
wild plants, 694

Quercus falcata var. *pagodaefolia*, *Polyporus hispidus*, trunk canker, 177
nigra, *Polyporus hispidus*, trunk canker, 177
nuttalli, *Polyporus hispidus*, trunk canker, 177; **illuss. 179, 180**
phellos, *Polyporus hispidus*, trunk canker, 177; **illuss. 179, 180**
spp., see also Oak

RAABE, ROBERT D., 55, 695
Radioisotopes, C^{14} accumulation in diseased leaves, 43; **illus. 46**
Radioisotopes—*continued*
P^{35} accumulation in diseased leaves, 43; **illus. 46**
S^{35} accumulation in diseased leaves, 43; **illus. 45**
RAPPAPORT, I., 695
Raspberry, blackberry mosaic virus, transmission to ,272
REED, H. E., 350
Resistance, alfalfa to root-knot, 70; **illus. 71**
barley to net blotch, inheritance, 174
bean to bacterial blights, testing method, 519; **illus. 520**
cabbage to blackrot, 55
blackrot, inheritance of, 35; **illus. 36**
cowpea, Brown Sugar Crowder, to Fusarium wilt, 347
to cucumber mosaic virus, 563
cucumber to mosaic, varieties, 451
to scab, varieties, 451
oats to crown rust, 219; **illuss. 220, 275**
to crown rust, sources of, method, 410
to Helminthosporium blight, 219; **illus. 220**
to stem rust, mutation, X-ray, 490
pepper to Cercospora, 347
potato to frost injury, South America, 247
to late blight, breeding South America, 247
to *Phytophthora infestans*, histology, 546; **illuss. 549, 551**
Solanum spp. to *Phytophthora infestans* races, breeding, 464
soybean to root knot nematode, 347
spinach blight, screening for, 635
blue mold, screening plants for, 635
strawberry to Verticillium wilt, 387; **illus. 388**
tobacco to black shank, 348, 349
to black shank, nematode relationship, 459; **illus. 460**
varieties, 463
to Fusarium wilt, 348
varieties, 463
to mosaic virus, 463
to nematodes, 349
to wildfire, varieties, 463
tomato to Fusarium, 303
late blight, inheritance, 103, 186
to *Phytophthora infestans* races, breeding, 464
Venturia inaequalis to fungicides, tests, 467; **illus. 469**
wheat to bunt, environmental factors, 428; **illus. 430, 432, 433**
to loose smut, 8
reaction, 513; **illus. 514**
REYNOLDS, HAROLD W., 70
Rhaphiolepis spp., see Hawthorn
Rhizoctonia cotton seedling, control, 350
solani control in gladiolus, 693
control, soil factors and fungicides, 466
Croft lilies, nutrition, control, 156; **illus. 159**
effect of CO_2 on distribution in host, 693
nub-root, cotton and flax, 413
tomato damping-off control, 347
turf, control, 186
sp., *Bacillus subtilis*, antagonistic, 252; **illuss. 255, 257**
spp. poinsettia root rot, 552
tomato fruit tumor, 136
Rhizopus in cotton seedlings, control, 350
Rhopalosiphum prunifoliae, barley and oats yellow dwarf virus, 695
Rhus typhina, see Sumac
Rhynchosporium secalis in barley, control, 350
R-I-26, see under Nematocides
RICE, ROBERT V., 145
RICH, A. E., (185), 186
RICHARDS, M. C., (186)
RIKER, A. J., (618)
ROHDE, R. A., (673)
ROISTACHER, C. N., 517
ROMANKO, R. R., 466
Root-knot, see under Nematodes
ROSBERG, DAVID W., 49

Rose blackspot control, 465
Verticillium wilt, 695
ROSEN, H. R., 219
ROSS, ELDON, (466)
Rotylenchus brachyurus pathogenicity in tobacco, 347
ROWELL, J. B., 370
Rubrofusarin, *Fusarium oxysporum* var. *nicotianae*, production by, 350
RUSHDI, M. H. K., 466
Rust, bean, chemicals in leaves, 43; **illuss. 45, 46**
crown, oats, reaction, 462, **illus.**
resistance, 219; **illus. 220, 275**
stem, bluegrass, control, 186
wheat, races in South America, 242; **illuss. 243, 244**
Rye, wheat streak mosaic virus, mite spread, 116
a winter, wheat mosaic virus, identifying, 637

Saccharomyces, fungus culture, 466
pastorianus, filipin, 559
SAFEEULLA, K. M., 128
Samolus parviflorus curly top virus, reaction and recovery, 531; **illuss. 532, 535**
Sansevieria, nematode control, 347
SASSER, J. N., (349), 459, (537), 540
SAYED, G. S., 186
SCHAAL, LAWRENCE A., 626
SCHALLER, C. W., 174
SCHEFFER, R. P., (303), (381)
SCHROEDER, HARRY W., 288
SCHROEDER, W. T., (338)
SCHUSTER, M. L., 519
Sclerophthora macrospora in wheat, corn downy mildew compared, 350
Sclerospora sorghi, maize and sorghum, India, 128; **illus. 130**
Sclerotinia fructicola control, 695
fructicola, quantitative cyclone spore collector method, 239; **illus. 239**
intermedia, species concept, variability, 421; **illus. 425**
minor, species concept, variability, 421; **illus. 425**
sativa, sclerotium size, **illus. 425**
sclerotiorum, species concept, variability, 421; **illus. 425**
spp., sclerotium size, **illus. 425**
species concept, variability, 421; **illus. 425**
trifoliorum apothecial production, 185
physiological differences between strains, 39
species concept, variability, 421; **illus. 425**
Sclerotium rolfsii in gladiolus, methyl bromide, control and injury, 520
rolfsii, light, response to, 465
soil microorganisms, antagonistic, 417; **illus. 418**
thiamin, 417
SCOTT, H. A., (288)
Secale cereale, wheat mosaic virus, for identifying, 637
Seed counters, vacuum, **illus. 96**
disinfecting apparatus, **illus. 95**
drier, aseptic, **illus. 96**
maturation effect on bean southern mosaic virus, 17
pathogen isolation from, method, 94; **illuss. 95, 96**
transmission, bean southern mosaic virus, 18
treatment, barley loose smut, water-soak, 518
barley, water-soak, germination, effect, 518
Semesan, *Rhizoctonia solani*, 466
SENSENEY, C. A., (334)
Septoria avenae in oats, 279; **illuss. 279, 280**
avenae, oats, moisture and temperature effect, control, 181; **illus. 182**
Puccinia coronata var. *avena*, 462
lycopersici, medium for, 461
Serratia marcescens, *Sclerotium rolfsii* effect, **illus. 418**
Shallot pink root, actinomycetes antagonism, 440; **illuss. 441**
Pyrenochaeta terrestris in, 350
SHANDS, H. L., (181)
SHANKS, JAMES B., (552)
SHURTLEFF, M. C., 186
SIDERIS, C. P., 590
SIEGEL, A., 695
SILL, W. H., JR., 637
SIMONS, JOHN N., 217
SIMONS, M. D., 275, 410, 462
SINCLAIR, J. B., 563
SKOTLAND, C. B., 603, 665
SLYKHUIS, JOHN T., 116
SMART, HELEN F., (649)
SMITH, FLOYD F., (464), (465)
SMITH, WILSON L., JR., 88, 649
SMOOT, JOHN J., (673)
Smut, barley loose, varietal resistance, 73, **illus. 77**
wheat loose, inheritance of resistance, 8
SNOW, GORDON F., 696
Sodium, see also under Nutrition
benzoate, antifermentative for culture of *Panagrellus redivivus*, 184
diethyl dithiocarbamate, tomato resistance, effect, 303
fluoride, tomato Fusarium resistance, effect, 303
methyldithiocarbamate, see Fungicides, Stauffer N-869
sulfanilate, see under Fungicides
Soil Bacteria, antibiotics production and role, 407
conditions, lettuce root rot, associated with, 184
fumigation, gladiolus, 693
fumigants, DD, nitrogen in soil, tobacco, nematodes, 163
DD (dichloropropene-dichloropropane) tobacco growth, nematodes, 163
Dowfume W-85 (1,2-dibromoethane), strawberry root rot and decline, ectoparasitic nematodes, 183
methyl bromide, gladiolus, 693
moisture effect on *Septoria avenae* in oats, 181
Rhizoctonia solani, fungicides, factors effect, 466
temperature effect on potato virus X, *Nicotiana* spp., 493
Verticillium albo-atrum longevity in, 180
-water, maple *Verticillium* wilt, relation, 184
Solanum aculeatissimum, *Stemphylium* **floridanum** in, 11
citrullifolium, golden nematode, stimulation of larval emigration, 184
demissum, late blight, breeding for resistance, review, 250
Phytophthora infestans, histology, 546; **illuss. 549, 551**
dulcamara, golden nematode, stimulation of larval emigration, 184
spp. breeding South America, 247
golden nematode, stimulation of larval emigration, 184
late blight, breeding for resistance, review, 250
Phytophthora infestans, resistance to races, breeding, 464
Stemphylium **floridanum** in, 15
tuberosum, see Potato
xantii, golden nematode, stimulation of larval emigration, 184
SOMMER, NOEL F., 607
Sorghum, *Sclerospora sorghi* in, India, 128; **illus. 130**
South America, potato wild species and breeding, 247
wheat rust races, 242
SOVA, CARL, (636)
Sowbane, sugar beet yellows, mechanical transmission, 233; **illus. 234**
Soybean bud-blight, tobacco—and tomato ringspot virus, incintant, 500; **illus. 501**
Meloidogyne spp., in, Brazil, 465
Pyrenochaeta terrestris in, 350
root-knot nematode, resistance to, 347
tobacco anthracnose in, 465
Spergon, see Fungicides, chloranil
Spinach bacterial soft rot, control in packaged, 88
blight resistance, screening plants for, 635
blue mold, screening plants for, 635
Fusarium wilt, beet, relationships, 346
Spore germination, inhibition, *Puccinia graminis*, 259; **illuss. 260, 261, 263, 265**
isolation method, 405; **illus. 406**
SPRAGUE, RODERICK, 696

Sproston, Thomas, (185)
Spruce canker control, 686
canker, *Valsa kunzei* relation to, 686; **illus. 688**
Squash mosaic virus, 3 components in, 145
mosaic virus, electron microscopy, **illus. 192**
sedimentation patterns, **illus. 146**
Stahmann, Mark A., (145), 187, (303), (381), (524), (603)
Starch from cells of leafroll virus infected potatoes, 185
Starr, Mortimer P., 613
Stauffer —, see under Fungicides
Sterre, Russel L., 196
Steiner, G., 466
Stemphylium botryosum, alfalfa, 352; **illus. 353**
botryosum, *Pseudoplea briosiana*, relationship, 352
S. callistephi, *S.* **floridanum** conidia, **illus. 13**
S. botryosum, *S.* **floridanum** conidia, **illus. 13**
floridanum sp. nov., tomato leaf spot, 11; **illuss. 12, 13**
solani, histology in tomato, 654; **illuss. 655-657**
S. **floridanum** sp. nov. compared, 11; **illuss. 12, 13**
sporulation in culture, irradiation, 141; **illuss. 142, 143**
tomato, temperature effect, 168; **illuss. 169, 171**
sp., light, response to, 465
nutrition tests, 676; **illus. 677**
spp., grape decay, 229
medium for, 461
Stewart, Robert B., 413
Stone fruit ring spot virus, cherry, 565
virus, PLMV, purification, 574; **illus. 575**
Strawberry root rot and decline, ectoparasitic nematodes, control, 183
variegation, 464
vein banding virus, 307; **illus. 309**
Verticillium wilt resistance, 387; **illus. 388**
virus-free and non-virus-free study, 183
Streptomyces **filipinensis**, nov. sp., filipin from, 559; **illus. 560**
fungus culture, 466
scabies, phenolic compounds, inhibition, 626; **illus. 627**
Streptomycin, see under Antibiotics
Streptothricin, see under Antibiotics
Stromatinia gladioli control, 693
gladioli, nutrients effect on sclerotia production, 465
nutrition tests, 676; **illus. 677**
Stroube, W. H., (417)
Stysanus sp., *Verticillium albo-atrum*, antagonistic, 696
Subtilin, soil, production and role, 407
Succinic acid effect on TMV multiplication, 291
Sugar beet damping-off, *Bacillus subtilis* antagonistic to pathogen, 252; **illuss. 255, 257**
Sugar cane mosaic virus, electron microscopy, 694
red rot, yeast antibiosis, 37; **illus. 38**
Sulfur, see under Fungicides
Sumac Fusarium wilt, aster relationships, 346
Sunflower, tobacco anthracnose in, 465
Sweet potato, internal cork virus, elimination, 185
internal cork, phellem, diagnostic symptom, 290
Sylvester, Edward S., 357

Takahaski, William N., 696
Tapke, V. F., 73
Tarjan, A. C., (184), 350
Taxonomy, biological, coding, 58
Taylor, A. L., 26
Taylor, Carlton F., 673
Taylor, Edgar A., (465)
Taylor, Jack, 392
Techniques, autoradiograph, tobacco mosaic virus exposed to Na_2S^{35}, 44
bacteria and fungi, medium for, 461
bacteriophage of *Xanthomonas pruni*, production, 580
bean resistance to bacterial blights, testing, 519; **illus. 520**
Techniques—*continued*
breeding, *Phytophthora infestans* physiologic races, use in, 464
cherry viruses index plant, *Prunus tomentosa*, 320; **illuss. 321-323**
colorimetry, viruses, 196
dilution end-point, stream double refraction, 196
dry-weight determination, viruses, 196
electron microscopy, 187; **illuss. 189, 190, 192, 194; 196, 208**
apparatus for frozen-dried specimens, **illus. 190**
electrophoresis, zone, virus assay, 211
fungi and bacteria, medium for, 461
fungicides testing, lab., *Phytophthora cinnamomi*, 398; **illus. 401**
fungus culture conservation, method comparison, 466
gladiolus hot-water treatment, 693
grape in storage, forecasting decay, 229; **illuss. 230, 231**
inoculation of citrus, 517, **illuss.**
and incubation, *Phytophthora infestans* in *Solanum demissum*, 546
insect vector viruses, 196
wheat bunt, 480
techniques, insect vectors, virus assay, 208
longevity of *Endoconidiophora fagacearum* under mineral oil, 405
mechanical inoculation, viruses, 196
nematode culture, antifermentative chemicals for, 184
estimating population, 238; **illus. 238**
oats resistance to crown rust, sources of, 410
pathogen isolation from seed, 94; **illuss. 95, 96**
purification, viruses, 196, 208
seed counters, vacuum, **illus. 96**
disinfecting apparatus, **illus. 95**
drier, asceptic, **illus. 96**
serology, viruses, 196
sexual compatibility, *Ustilago zeae*, 370; **illus. 372**
spectrophotometry, viruses, 196
spinach blight and blue mold resistance, screening for, 635
spore collector, quantitative cyclone, 239; **illus. 239**
isolation device, 405; **illus. 406**
stone fruit virus, PLMV, purification, 574; **illus. 575**
stream double refraction, dilution end-point, 196
susceptible strawberry plant elimination, Verticillium wilt, 387
toxin production, *Helminthosporium victoriae* bioassay, 456
Ustilago nuda physiologic races study, 73
viruses, assay, review, 196
insect-transmitted, review, 208
sources, 209
wheat mosaic virus, a winter rye for identifying, 637
Tehon, Leo Roy, biographical sketch, 115, **illus.**
Temperature effect on *Alternaria tomato*, 168; **illuss. 169, 171**
aphid transmission of lettuce mosaic, 357
oak wilt mat formation, 485; **illus. 487**
oats crown rust resistance, 219; **illus. 221**
Helminthosporium blight resistance, 219; **illus. 221**
light, pycnidia production, *Physalospora obtusa*, effect, 24
Phytophthora infestans germination, 673; **illuss. 674, 675**
poinsettia root rot, 552; **illuss. 553, 557**
potato internal brown spot, associated with, 184
soft rot, suberin and periderm formation, 649; **illuss. 651-653**
virus X, 313; **illus. 316**
Nicotiana spp., 493; **illuss. 494-496**
symptoms; 445; **illuss. 447-449**
Puccinia chrysanthemi, 644; **illuss. 645-647**
Septoria avenae in oats, 181
Stemphylium solani in tomato, 168; **illuss. 169, 171**
tobacco mosaic virus, 595

Temperature—*continued*
tomato fruit tumor, **illus. 135**
wheat bunt inoculation, 480
resistance, 428; **illus. 432**
walnut branch-wilt, 607
Terramycin, see under Antibiotics
Tersan, see Fungicides, thiram
Tetrachloro-*p*-benzoquinone, see Fungicides, chloranil
Tetrachloronitrobenzene, grape injury in storage, 137
Tetracycline, *Pyracantha*, translocation, 692
Tetrahydro-3,5-dimethyl-2*H*-1,3,5-thiadiazine-2-thione, see Fungicides, Stauffer N-521
Tetramethylthiuram disulfide, see Fungicides, thiram
Thiamin, *Sclerotium rolfsii*, 417
Thiamine effect on wheat bunt inoculation, 480
Thielaviopsis basicola, poinsettia root rot, 552; **illuss. 553, 555, 557**
basicola, resistant tobacco varieties, 463
Thiolutin, see under Antibiotics
Thiouracil, bean southern mosaic virus, effect, 281
tobacco mosaic virus, effect, 281
Thiourea, tomato Fusarium resistance, effect, 303
Thiram, see under Fungicides
THIRUMALACHAR, M. J., 91, (128)
THOMAS, H. EARL, (272), (694)
THUNG, T. H., (695)
Tilletia caries in wheat, chlamydospore formation, **illus. 432**
caries, wheat inoculation methods, 480
wheat resistance, environmental factors, 428; **illuss. 430, 432, 433**
spp., *Gibberella zeae* antagonism, 288
Helminthosporium sativum antagonism, 288
TIMIAN, ROLAND G., 313, 445
Timothy Helminthosporium leaf streak, 227; **illus. 227**
TIMS, E. C., 350, (440)
TISDALE, W. H., 1
Tobacco anthracnose host range, 465
bacterial wilt, composition of leaves, 506
black shank fungus pathogenicity, 346
isolate comparisons, 346
nematode relationship, 459; **illus. 460**
resistance, 348, 349
varieties, 463
carnation ringspot virus, 464
Criconemoides sp. pathogenicity on, 347
cyst nematode, effect on growth, control, 163
Fusarium wilt, composition of leaves, 506
nutrition and metabolism, 350
resistance, 348
varieties, 463
Granville wilt, root-knot nematode, 537; **illuss. 538, 539**
mosaic virus, anomalous proteins associated with, 696
assay techniques, 196
calcium deficiency effect on, 288
chemical accumulation in leaves, 43; **illus. 45**
Cymbidium mosaic, compared in *Datura stramonium*, **illus. 331**
early time course of, 695
electron microscopy, **illuss. 189, 192, 194**; 603; **illuss. 604-606**
Nicotiana glutinosa, 695
noformicin effect, 281
organic acids effect on, 291
resistant varieties, 463
strains, 696
temperature of infection, effect, 595
thiouracil effect, 281
tomato seed, 636
nematodes, control, 349
resistance, 349
potato virus X, nutrition, 567; **illus. 570**
temperature effect, 493; **illuss. 494-496**
Pseudomonas solanacearum, pathogenicity of isolates, 348
Tobacco—*continued*
ringspot virus assay techniques, 196
composition of leaves, 506
nutrition, cucumber, 567; **illus. 570**
soybean bud-blight incitant, 500; **illus. 501**
root-knot nematode-black shank relationship, 459; **illus. 460**
control, 349
rotation, season, effects, 540; **illuss. 543, 544**
root-rot, black, resistant varieties, 463
Rotylenchus brachyurus pathogenicity on, 347
Stemphylium **floridanum** in, 11
wildfire resistant varieties, 463
toxin, mode of action, 659; **illuss. 600-663**
Tomato anthracnose, foliage, inoculum source, 338; **illuss. 340, 342-344**
bacterial canker, anatomy of infected plants, 267; **illuss. 268-270**
Cattleya Fusarium wilt in, 599; **illus. 601**
collar rot, air temperature effect, 168; **illuss. 169, 171**
crown gall, antibiotics, inhibition, 618; **illuss. 621, 623, 624**
damping-off control, 347
early blight, anthracnose, 340
fruit tumor, etiology, control, 132; **illus. 133**
Fusarium wilt, enzyme role, 381
nutrient sprays, 443
pectic enzymes role in, 79; **illus. 82**; 524, **illus. 525**
resistance, 303
gray leaf spot, air temperature effect, 168; **illuss. 169, 171**
histology, 654; **illuss. 655-657**
late blight, breeding for resistance, 186
leaf spot, *Stemphylium* **floridanum** sp. nov., 11, **illuss. 12, 13**
nailhead spot, air temperature effect, 168; **illuss. 169, 171**
Phytophthora infestans races, potato, relationship, 473
resistance to races, breeding, 464
Pseudomonas solanacearum, pathogenicity of isolates, 348
Pyrenochaeta terrestris in, 350
ring spot virus biophysical characteristics, electrophoresis, electron micrographs, 334; **illuss. 335, 336**
soybean bud-blight incitant, 500; **illus. 501**
spotted-wilt virus, techniques, review, 208; **illus. 214**
TMV on seed, 636
tobacco anthracnose in, 465
TOOLE, E. RICHARD, 177
Torulopsis, fungus culture, 466
Toxin production, *Helminthosporium victoriae*, 453; **illuss. 456, 457**
TRESHOW, MICHAEL, 132
N-(Trichloromethylthio)-4-cyclohexene-1,2-dicarboximide, see Fungicides, captan
Trichoderma, fungus culture, 466
Trichodorus sp., in cotton, 349
αα-Trithiobis(*N*-dimethylthioformamide), see Fungicides, Crag 5400
TRUE, R. P., 466
Tucker, Clarence Mitchell, biographical sketch, 351, **illus.**
Turf brown patch control, 186
nematode control, 350
snow mold control, 59; **illus. 61**
Turnip yellow mosaic virus, electron microscopy, **illuss. 189, 192, 194**
Tylenchorhynchus spp., see under Nematodes
Typhula itoana in turf, control, 59; **illus. 61**
Tyrothricin, *Agrobacterium tumefaciens* and gall tissue, 618

Ultraviolet, filipin assay, **illus. 560**
radiation, *Stemphylium solani* sporulation, 141; **illuss. 142, 143**
Uncinula necator control, 695

Uromyces phaseoli, chemicals in infected leaves, 43, **illus. 45, 46**
Ustilago kolleri, haplo-lethal deficiency, 521, **illus.**
maydis, quantitative cyclone spore collector method, 240
nuda, longevity in barley seed, 637
physiologic races, 73
U. tritici, spore germination study, 585; **illuss. 586-588**
tritici, wheat inheritance of resistance, 8
wheat varieties reaction, 513; **illus. 514**
zeae, sexual compatibility studies, 370; **illus. 372**

Vaccinium spp., wild, blueberry stunt virus sources, 465
VALLEGA, JOSÉ, 242
Valsa kunzei, conifer canker, relation to, 686; **illus. 688**
var. **kunzei** var. nov., 689
var. **piceae** var. nov., 689
Vancide, see under Fungicides
VAN DER PLANK, J. E., (222)
Vapam, see Fungicides, Stauffer N-869
Variegation, strawberry, 464
VARNEY, E. H., (465)
VAUGHAN, EDWARD K., 56
V-C 1-13, see under Nematocides
VENKATARAM, C. S., 240
Venturia inaequalis, resistance to fungicides, tests, 467; **illus. 469**
VERGARA, CLAUDIO, (695)
Verticillium albo-atrum, avocado susceptibility, 635
albo-atrum, fungicide tests, 398; **illus. 401**
light, response to, 465
longevity, 180
rose rootstock infections, 695
soil fumigation, 696
organisms, antagonistic, 696
strawberry resistance, 387; **illus. 388**
cotton seedlings, control, 350
sp. antibiotic tests in Elm, 185
soil-water and sapwood-water content related to, in maple, 184
toxins produced by, 183
Vinca, blueberry stunt virus, 465
Viomycin, soil, production and role, 407
Viruses, general, assay techniques, review, 196
chemical assay, 196
colorimetry, 196
dry-weight determination, 196
electron microscopy, 187; **illuss. 189, 190, 192, 194, 196**
generation time, 696
insect-transmitted, techniques, review, 208
vector inoculation, 196
labile, purification techniques, 208
mechanical inoculation, 196
Prunus spp., anthocyanosis and carbohydrate content of leaves, 184
purification, 196
serology, 196
spectrophotometry, 196
stream double refraction, dilution end-point, 196
Viruses, almond bud failure in peach, 323; **illuss. 325, 326**
apple green mottle, 186
mosaic in peach, 292; **illus. 293**
barley yellow dwarf, Holland, 695
bean mosaic, a gladiolus—similar to, 696
southern mosaic, noformicin effect, 281
seed maturation effect, 17
thiouracil effect, 281
blackberry mosaic complex, 272; **illus. 273**
blueberry stunt, wild sources, 465
carnation mosaic, 464
ringspot, 464
Cattleya leaf necrosis, Cymbidium mosaic, 327; **illuss. 328, 329**
celery-yellows, leafhopper transmission to aster, 185
Viruses—*continued*
cherry buckskin, leafhopper vectors, 694
"freckle fruit," 696
necrotic ring spot, *Prunus tomentosa* index plant, 320; **illuss. 321-323**
chrysanthemum aspermy, 2; **illus. 5**
flower distortion, 2; **illus. 5**
mosaic, 2; **illus. 5**
citrus tristeza, yellows and pitting complex, 222
cucumber mosaic, cowpea resistance, 563
mosaic, resistant varieties, 451
southern, insect transmission, 217; **illus. 218**
curly top, water pimpernel reaction and recovery, 531; **illuss. 532, 535**
Cymbidium mosaic hosts, electron microscopy, 327; **illuss. 328, 329, 331**
fig mosaic mite transmission, 52, **illus. 53, 54**
a gladiolus—similar to bean mosaic, 696
lettuce mosaic, aphid transmission, 357; **illus. 368**
seed transmission, 63; **illuss. 65, 67**
oats yellow dwarf, Holland, 695
pea streak, aphid, 665, **illus.**
electron microscopy, **illus. 189**
peach apple mosaic in, 292; **illus. 293**
"mule ear" from almond bud failure, 323; **illuss. 325, 326**
rosette, antibiotics, chemotherapy, 348
Prunus tomentosa index plant, 320; **illuss. 321-323**
western X, yellow leaf roll, interference, 694
yellow bud mosaic, soil, retention by, 696
yellow leaf roll, celery host, 694
leafhopper transmission, celery, 694
western X interference, 694
potato leafroll, reaction of starch from cells, 185
S, latent virus related to, 693
X immunity, 445; **illuss. 447-449**
immunity, clonal lines, 313; **illuss. 316, 318**
latent virus related to S, 693
nutrition, *Nicotiana* spp., 567; **illus. 570**
temperature effect in *Nicotiana* spp., 493; **illuss. 494-496**
Y, varieties reaction to, 148
yellow-dwarf, techniques, review, 208; **illus. 214**
prune dwarf, *Prunus tomentosa* index plant, 320; **illuss. 321-323**
squash mosaic, 3 components in, 145
electron microscopy, **illus. 192**
sedimentation patterns, **illus. 146**
stone fruit ring spot, cherry, 565
PLMV, purification, 574; **illus. 575**
strawberry free and non-free plants, 183
vein banding, 307; **illus. 309**
sugar beet yellows, mechanical transmission, 233; **illus. 234**
sugar cane mosaic, electron microscopy, 694
sweet potato internal cork, elimination, 185
tobacco mosaic, assay techniques, 196
mosaic, calcium deficiency effect, 288
chemicals in leaves, 43; **illus. 45**
Cymbidium mosaic, compared in *Datura stramonium*; **illus. 331**
early time course of, 695
electron microscopy, **illuss. 189, 192, 194**; 603; **illuss. 604-606**
Nicotiana glutinosa, 695
noformicin effect, 281
organic acids effect on, 291
proteins, 696
resistant varieties, 463
strains, 696
temperature of infection, effect, 595
thiouracil effect, 281
tomato seed, 636
ringspot, assay techniques, 196

Viruses, tobacco ringspot—*continued*
composition of leaves, 506
nutrition, cucumber, 567; **illus. 570**
soybean bud-blight incitant, 500; **illus. 501**
tomato ring spot, biophysical characteristics, electrophoresis, electron micrographs, 334; **illuss. 335, 336**
spotted-wilt, techniques, review, 208; **illus. 214**
turnip yellow mosaic, electron microscopy, **illuss. 189, 192, 194**
wheat mosaic, electron microscopy, 348
a winter rye for identifying, 637
Aceria tulipae, spread, control, 116; **illuss. 117-120**
wound-tumor, techniques, review, 208; **illus. 214**
yellow-net, Solanaceous hosts, 579, **illus.**
Vitamins, see under Nutrition and Nutrition of microorganisms
Volcani, Zafrira, (613)

Waggoner, Paul E., 79
Wagnon, H. Keith, (323), 696
Walker, J. C., (145), (303), (381), (443), 451, (524), (563)
Wallace, J. M., (52)
Walnut branch-wilt, sunburn effect, control, 607; **illuss. 608, 609, 611**
Water pimpernel curly top virus, reaction and recovery, 531; **illuss. 532, 535**
Waterman, Alma M., 686
Watermelon Fusarium wilt, 435; **illus. 436**
Weather, hot dry, associated with potato internal brown spot, 184
Webb, R. E., 579, 635
Weber, George F., (11)
Weeks, T. E., (574)
Weihing, John L., (595)
Weiss, Freeman A., 466
Wheat bunt, antagonism of root rotting organisms, 288
bunt, chlamydospore formation, **illus. 432**
inoculation methods, 480
resistance, environmental factors, 428; **illuss. 430, 432, 433**
calcium sulfamate effect, 503
loose smut, inheritance of resistance, 8
varieties reaction, resistance, 513; **illus. 514**
mosaic virus, electron microscopy, 348
a winter rye for identifying, 637
Puccinia graminis var. *tritici*, heterocaryosis basis for variation, 639; **illuss. 641, 643**
root-rotting organisms, antagonism to bunt, 288
rust races in South America, 242; **illuss. 243, 244**
seedlings, Tilletia infection, **illus. 430**
snow mold control, 696
Wheat—*continued*
stem rust control, 503
streak mosaic, *Aceria tulipae*, spread, control, 116, **illuss. 117-120**
Wheeler, H. E., (453)
Whitehead, Marvin D., 350, (413)
Whitfield, George B .,(559)
Wilcoxson, Roy D., (639)
Wildman, S. G., (695)
Wilhelm, Stephen, 180, (272), 387, (635), (695), 696
Williams, A. S., 290, (348)
Williams, H. E., 696
Wilson, E. E., 323
Wilson, J. B., 473
Wilson, W. F., (348)
Wolf, E. A., (291)
Wolf, Frederick A., 506
Wolf, Frederick T., 350, (506)

Xanthomonas campestris, cabbage inheritance of resistance, 35; **illus. 36**
campestris in cabbage varieties, 55
medium for, 461
geranii X. pelargonii, relationship, 613; **illus. 616**
malvacearum, bacteriophage attacking, 49; **illus. 50**
pelargonii X. gerani, relationship, 613; **illus. 616**
phaseoli, resistance to, testing method, 519; **illus. 520**
pruni, bacteriophage production, 580
time of infection related to spring canker, 285
spp., *Bacterium herbicola*, antagonism, 466
strains, bacteriophages specificity, 596; **illus. 597**
vesticatoria in pepper, control, 183
Xanthone, *Fusarium oxysporum* var. *nicotianae*, production, by, 350
Xiphinema spp., see under Nematodes
X-ray, oats stem rust, resistance, mutation, 490

Yanagihara, I., (238)
Yarwood, C. E., 43, 696
Yeast, sugar cane rot, antibiosis, 37, **illus. 38**
Young, D. W., 350

Zaumeyer, W. J., 466
Zentmeyer, George A., 109, 398, 635
Zerlate, see Fungicides, Ziram
Zinc dimethyldithiocarbamate, see Fungicides, ziram
ethelenebis [dithiocarbamate], see Fungicides, zineb
oxide, antifermentative for culture of *Panagrellus redivivus*, 184
Zineb, see under Fungicides
Ziram, see under Fungicides
Zscheile, F. P., (428), 480
Zygosaccharomyces prioranus, filipin, 559